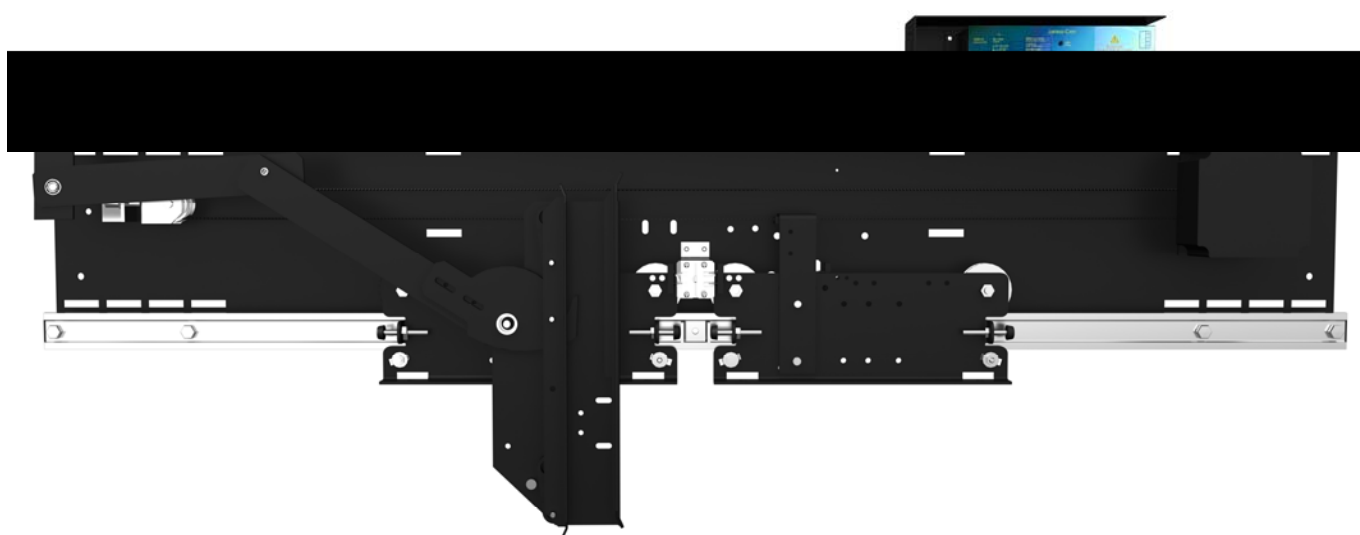


**Jarless-con
Center-opening Permanent Magnetic
VVVF Door Operator**

Operation Instructions



Operation Instructions



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Safety Notes

In this manual, the safety notes are divided into the following two categories:

-  **DANGER:** DANGER indicates a hazardous situation which is caused by operation not following the instructions. It may result in serious injury or even death.
-  **CAUTION:** CAUTION indicates a hazardous situation which is caused by operation not following the instructions. It may result in medium or slight injuries, as well as the damages to the equipment.

During installation, commission and maintenance of this system, please read this chapter carefully, and operate in compliance to the safety notes specified in this chapter. We will not be responsible for any damage or loss caused by operations against regulation.

1 Installation

DANGER

- Please install the equipment in the fire-retardant materials (like metal) to prevent fire!
- Keep it away from flammable material to prevent fire!

CAUTION

- Prevent the lead head or screw from dropping into it to avoid causing damage to the controller!
- Install the controller into the place where there is little vibration and no direct sunlight.
- Install the equipment into the weight-durable places to prevent injuries caused by the dropping of the equipment.
- Do not make the installation if the controller is found broken during unpacking!
- Do not make the installation if the shipping list is inconsistent with the goods!
- Handle with care; otherwise it may cause damage to the equipment!
- Do not touch the elements of the controller with your hands; otherwise it may cause the electrostatic damage!

2 Wiring

DANGER

- The instruction of this manual must be obeyed. The constructions must be carried out by the professional electrical engineering staffs to prevent from getting an electric shock or injury!
- There must be a breaker between the controller and power supply, or it may cause fire!
- Please carry out the correct standard earthing of the controller following the specification; otherwise there may be the risk of getting an electric shock!

CAUTION

- The input power supply must not be connected to the output terminals (U, V, W) of the controller. Pay attention to the marker of the wiring terminals, and do not make the wrong wiring! Otherwise it may cause the damage to the controller! Make sure that the wiring configuration is complied with EMC requirements and the local safety standards. Otherwise it may cause accidents!
- The communication line must be STP, the lay of which is 20~30 mm, and the shielding layer must be grounded.
- Make sure that the nominal voltage of the product is the same with that of the alternating current power supply so as to avoid the injury and fire!
- Pay attention to check if there is short in the peripheral circuit connected to the controller and whether the connected circuit is fastened. Otherwise it may cause damage to the controller!
- No part of the controller should take withstand test, as the product has taken it in the factory. Otherwise it may cause accidents!

3 Power-on



- The controller can only be powered on after the cover board be put in place. Do not open the cover board after power-on. Never touch any input and output terminal of the controller, or you may get an electric shock!
- All the wirings of the peripheral fittings must be complied with the instruction of this manual, and be carried out correctly following the circuit connection method provided in this manual. Otherwise it may cause accidents!
- Never change the controller manufactory parameter at will. Or it may cause damage to the equipment!
- Non-professional technician shall be forbidden to detect the signal during the operation. Otherwise it may cause damage to the people or the equipment!

4 Maintenance, inspection and replacement of components



- Please do not repair or maintain the equipment lively. Or you may get an electric shock!
- Personnel without professional training shall not be allowed to repair or maintain the controller. Otherwise it may cause damage to the people or the equipment!
- The parameter setting must be done after changing the controller; all of the plug-pull plug-ins must be plugged and pulled with the power off.
- The input power needs to be cut off during the maintenance and inspection, do it 5 minutes later to avoid getting an electric shock.

5 Usage beyond nominal voltage

If the external voltage is not within the allowable working voltage range specified in the manual, using the controller may cause damage to its parts easily. If it is required, please make a transformation using the corresponding voltage-boosting or voltage-reducing devices.

6 Protection against lightning impulse

This series of controllers are installed with lightning over-current protection device and can protect themselves from induction lightning to some extent. For the places where the lightning presents usually, the customer should add protection device to the front end of the controller.

7 Height above sea level and derating

At the place where the height above sea level is above 1000 meters, the heat dissipation effect of the controller may be reduced by the rareness of air. Then it will be necessary to make the derating. For the detail please make technique consultation with our company.

8 Notes on disusing controller

The electrolytic capacitor of the main circuit and the print plate may blow up when they are set on fire. The plastic parts will produce toxic gas when they are set on fire. Please treat them as industrial refuse.

9 About applicable motor

This controller is applicable for permanent magnetic synchronous motor; please select the controller as per the name plate of the motor.

In order to reach better control, it's required to make motor orientation in accordance with the actual motor situation.

The short of cable or the interior of the motor will cause the controller alarm even damage. For this reason, please take insulation and short test to the motor and cable which are installed for the first time, and this test is needed in the daily maintenance as well. Notice, the controller and the parts to be tested must be separated thoroughly during this kind of tests.

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1. Product instruction

1.1 Function description

Jarless-CON center-opening permanent magnetic VVVF door operator is a doors driving system, which adopts permanent-magnet synchronous motor drive and stepless speed regulation and frequency conversion control. The product is highly efficient, reliable and easy to operate. It can reach the optimum door opening/closing speed curve with low mechanical shock. Jarless-CON center-opening permanent magnetic VVVF door operator is applicable for a door system with a 700-1200mm net width of door opening.

Its main features are as follow:

- 1 (Stationary) autotuning of synchronous motor rotational angles
- 2 Autotuning of door width
- 3 Automatic opening/closing door demonstration
- 4 Fault alarm and automatic protection function
- 5 Optional baffle detection function
- 6 Synchronous and asynchronous door cutter selection function

1.2 Technical parameters

Input voltage: AC 220 V \pm 20%;

a) transducer:

Rated frequency: 50/60 Hz;

Output Voltage: 0 to 220 V;

Output frequency: 0 to 50 Hz

b) Motor:

Rated voltage: AC100/125/125 V;

Rated rotation speed: 180 r/min;

Rated power: 43/66/94 W

1.3 Operating conditions

a) Altitude 1000 m max., 100% of rated current output;

1000 to 2000 m, 95% of rated current output;

2000 to 3,000m, 85% of rated current output;

b) The highest relative humidity of the dampest month in the operation site is 95%, while the average lowest temperature of the same month is not higher than 25 °C;

c) The power supply voltage is limited within the range of \pm 15% of the rated voltage;

d) There will be no corrosive and explosive gas or conductive dusts in the surrounding air;

1.4 Operation principle

Jarless-con center opening permanent magnetic VVVF door operator is driven by a permanent magnetic synchronous motor with synchronous belt drive. It controls the opening and closing door operation by applying the stepless speed regulation and frequency conversion control technology. While the synchronous belt is driving, it forces the hanging board of the door to move. And the hanging board is connected with the car door, so the opening and closing operation of the car door is controlled in this way.

To install a swing-boom asynchronous door cutter: The swing-boom asynchronous door cutter should be installed on the car door and its swing boom should be connected with the cam handle of the movable cutter blade. While the car door is operating, with the effect of the swing boom, the cam handle of the movable blade shall force the movable blade to fold with the fixed blade and clip the roller of the landing door lock hook, so that the landing door lock unit is opened and the landing door moves in this way; In the moving process of the door, the door cutter clips the roller tightly all the time; After the door is closed to the full position, with the effort of the swing-boom, the door cutter will open and release the roller. In this way, the lock hook will lock up the landing door and car may separate from the landing door.

To install a synchronous door cutter: The synchronous door cutter should be installed on the hanging board of the door operator. When the car door is moving, the two blades will simultaneously clip the roller of the landing door lock hook with the effect of the synchronous belt, so the landing door lock unit is opened and forces the landing door to move. In the moving process of the door, the door cutter will clip the roller tightly all the time. After the door is closed to the full position, the cutter will open under the effort of the door cutter accessories and the car may leave the landing door at this time.

To install an integrated pulling protection asynchronous door cutter: The door cutter should be installed on the hanging board of the door operator. The movable blade is fixed on the door cutter base by the link and the link shaft. And a roller assembly is mounted on the movable blade, so when the car door is operating, this roller assembly will force the movable blade to fold with the fixed blade under the effect of the door cutter accessories and clip the roller of landing door lock hook to open the landing door lock unit and force the landing door to move. In the moving process of the door, the door cutter clips the roller tightly all the time. After the door is closed to the full position, the roller assembly of the asynchronous door cutter will open under the effect of the door cutter accessories and release the roller and lock the landing door with the lock hook. The pulling protection theory is as follow: The pulling protection door cutter of the integrated pulling protection asynchronous door cutter is fixed on the door cutter base through the joint arm and shaft. Also there are pulling protection hooks mounted on it. When the door is closed and under the leveling condition, the pulling protection hook is separated from the hook on the pulling protection accessories because of the effect of unlock roller assembly mounted on the head of the hall door and the pulling protection door cutter, and then the door operator can be opened. In the opening process of the door operator, the pulling protection door cutter will make tangential translation movement but no vertical movement under the action of the unlock roller assembly mounted on the head of the hall door. However, when the door is closed but not under leveling condition or is $\pm 260\text{mm}$ away from the leveling position, if there is external force (human pulling force) acting on the door operator, the car door will be opened gradually. In this process the pulling protection door cutter will move vertically for some time under the effects of the tangential translation movement of hanging board of the door operator and its own gravity. At this time the hook on the pulling protection door cutter will joggle gradually with the hook on the pulling protection accessories. At last, when the door board is pulled apart for a certain distance (100 mm max.), the hook on the pulling protection door cutter will hook on to the hooks on the pulling protection accessories, in which case the door board will be impossible to be pulled open.

2 Installation instruction for door operators

2.1 General illustration of door operator installation

General illustration of door operator installation: see Figure 2-1, Figure 2-2, and Figure 2-3

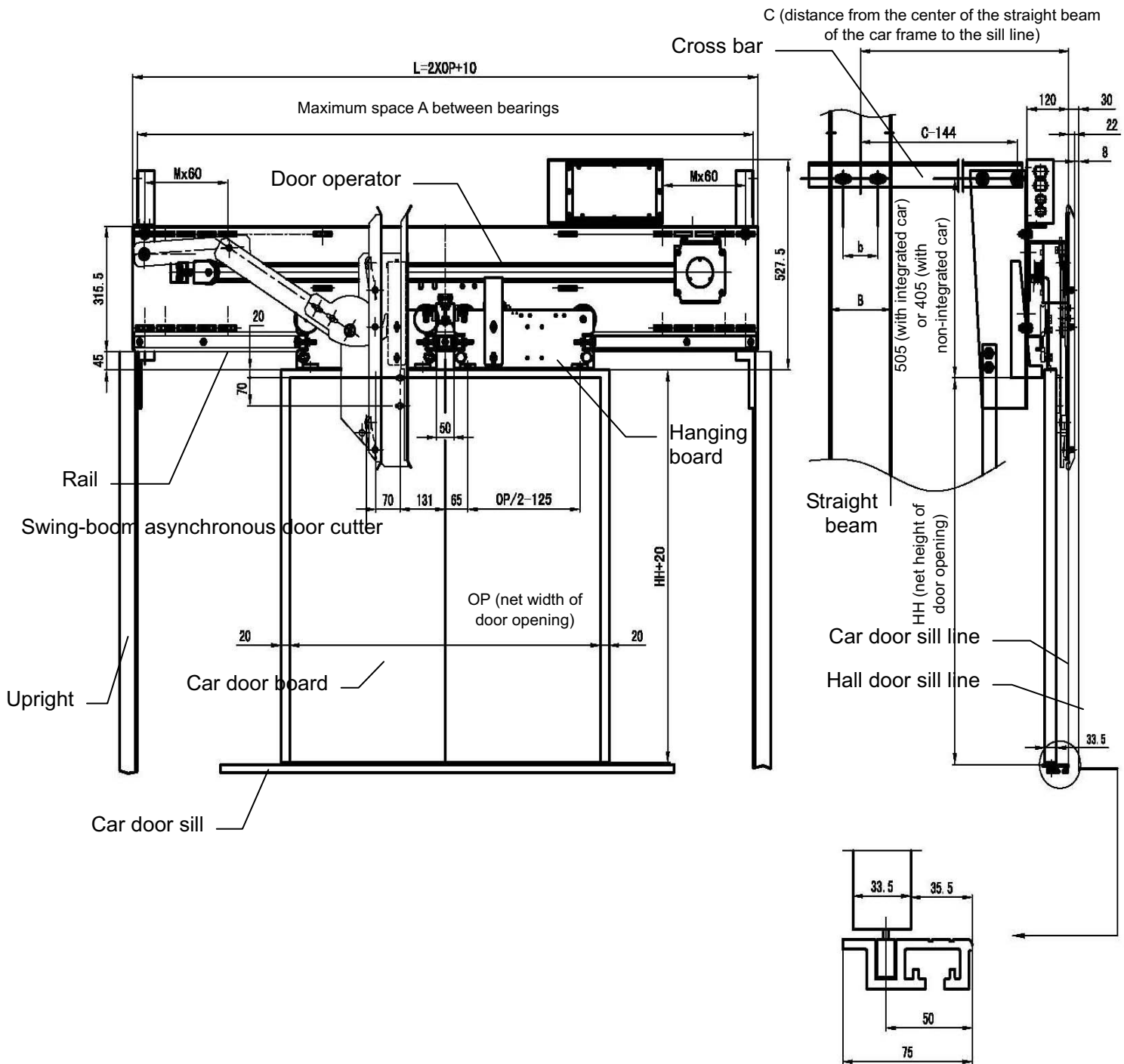


Figure 2-1 General illustration of door operator installation (installation of swing-boom asynchronous door cutter and upright)

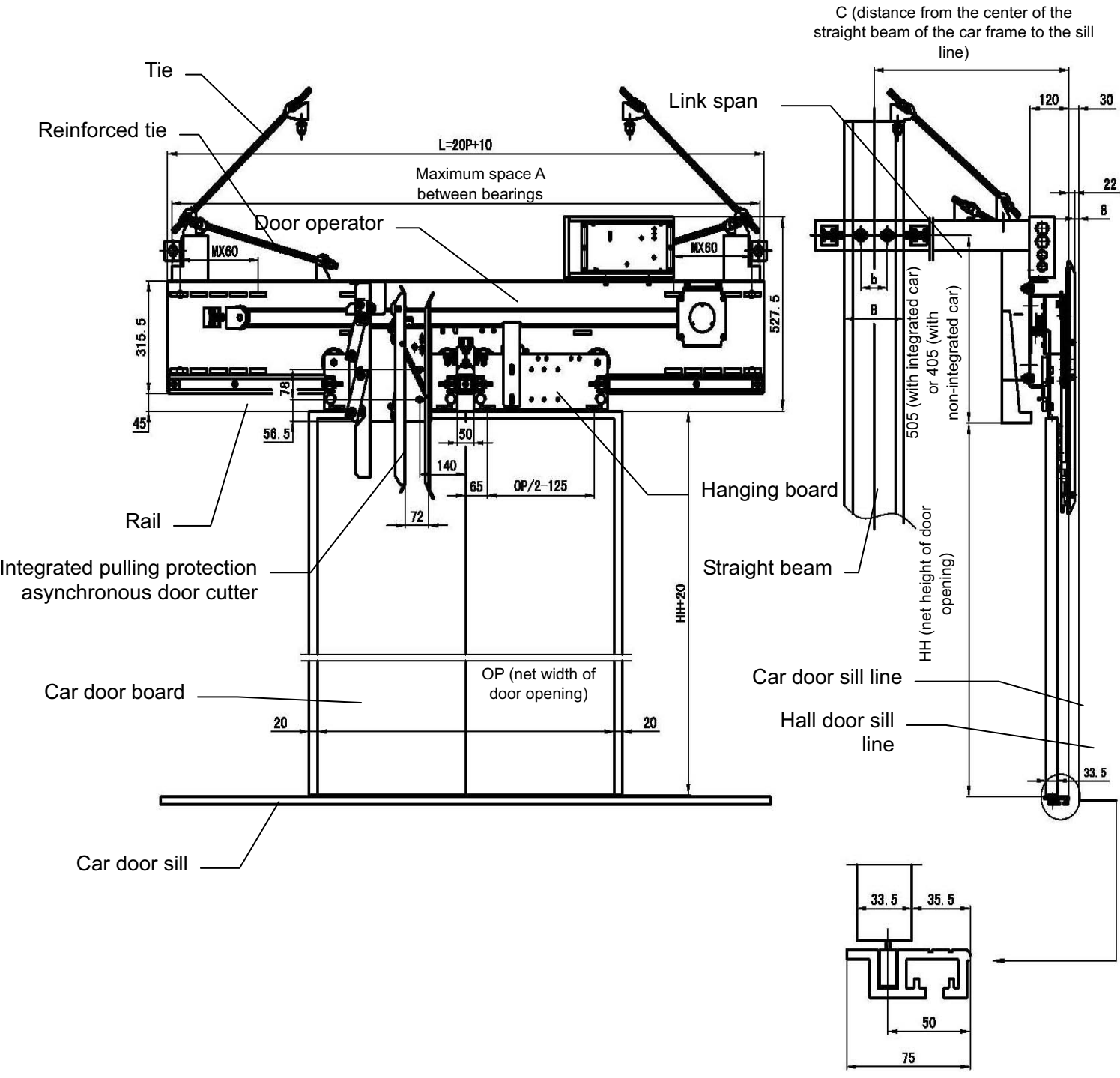


Figure 2-2 General illustration of door operator installation (installation of integrated pulling protection asynchronous door cutter and straight beam)

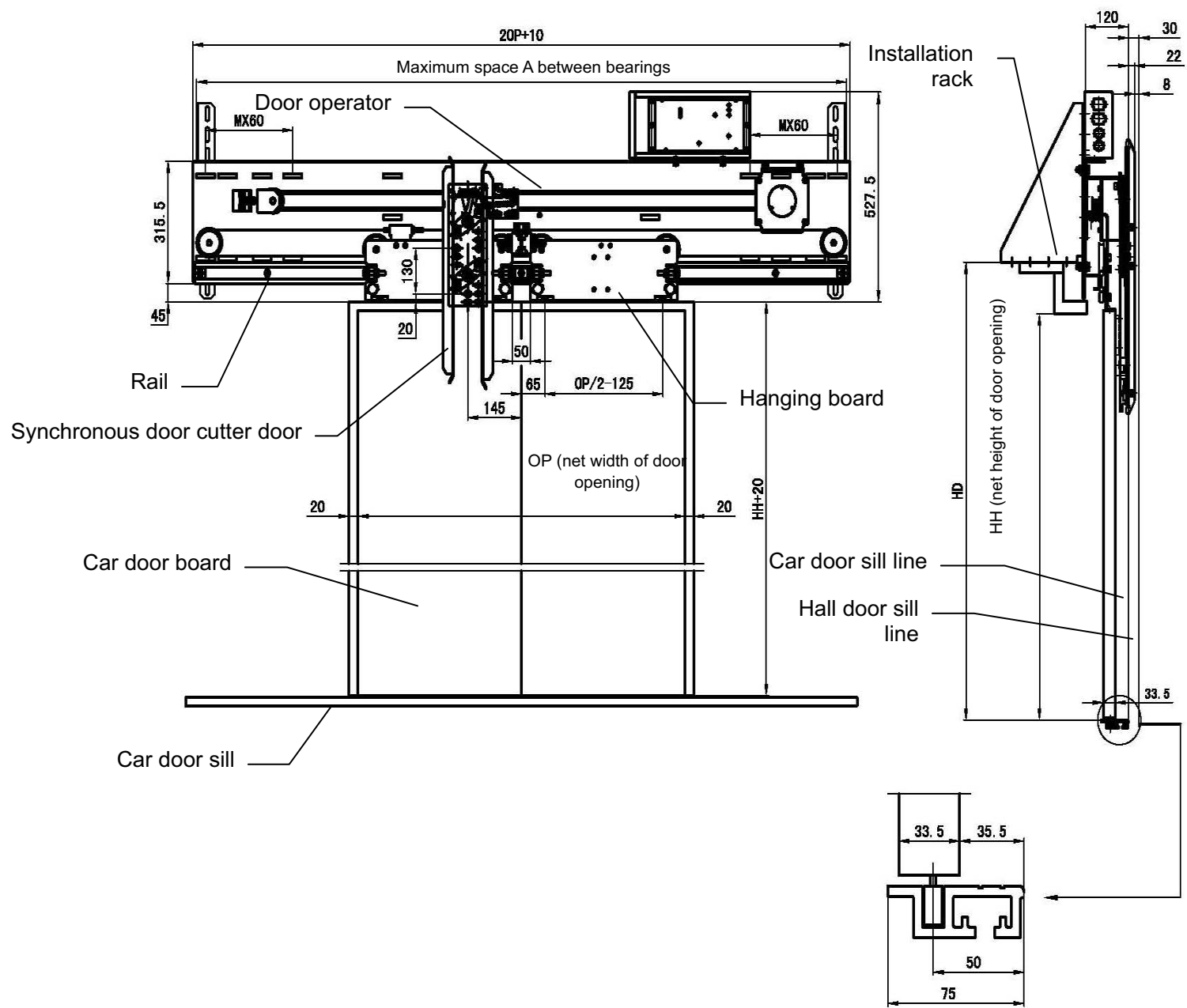


Figure 2-3 General illustration of door operator installation (installation of synchronous door cutter and car roof)

2.2 Installation and adjustment of door operator

2.2.1 Installation of door operator mounting bracket

2.2.1.1 Installation of the upright

The two cross bars should be mounted with fastening bolts on the two straight beam of the car, which need to be supported by adjusting bolts. Then the two door operator mounting brackets are to be mounted with fastening bolts on the two cross bars, and both ends of the two uprights shall be mounted with fastening bolts on the door operator mounting brackets and car base platform respectively. See Figure 2-4.

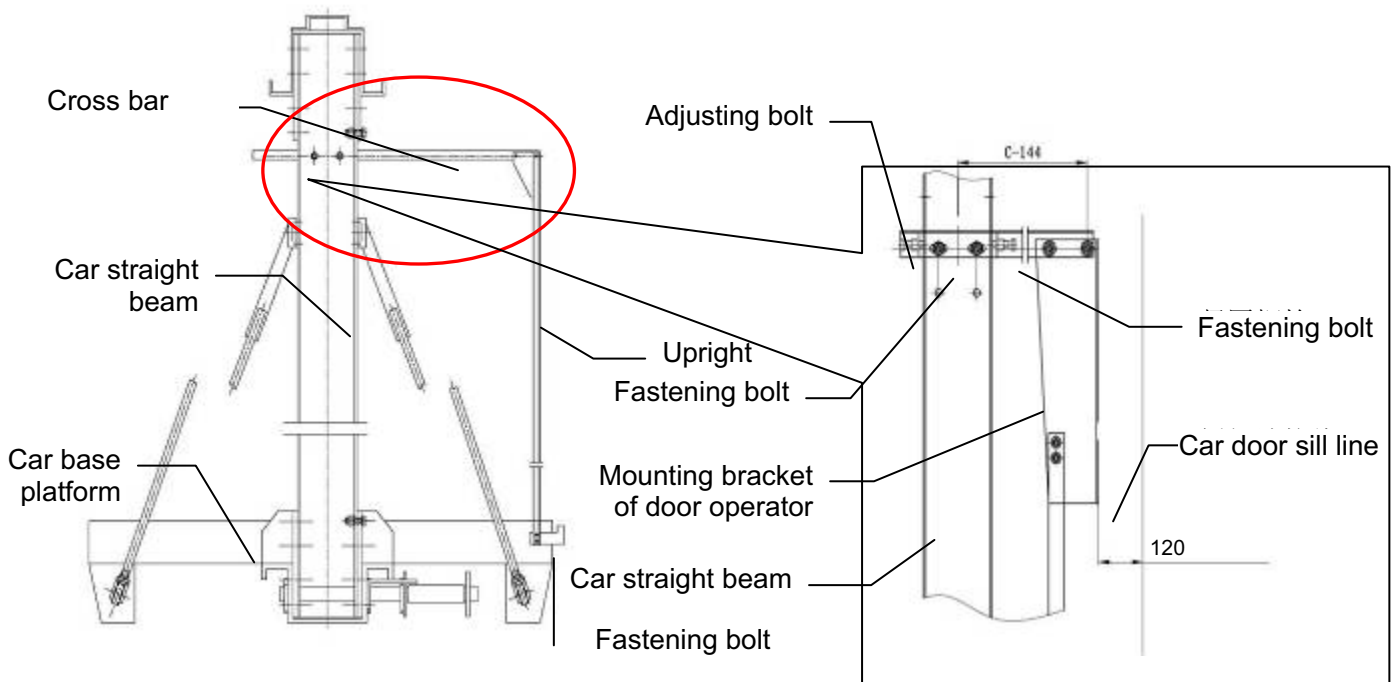


Figure 2-4 Installation of upright and cross bar of door operator

2.2.1.2 Installation of the straight beam

Mount the two cross bars with fastening bolts on the car straight beam respectively and hold the car straight beam with adjusting bolts. Then fix both ends of the two ties respectively on the cross bars and straight beam with the draw hook, and fasten them with nuts. And then mount the two door operator mounting boards on the two cross bars respectively and fasten them with bolts. See Figure 2-5

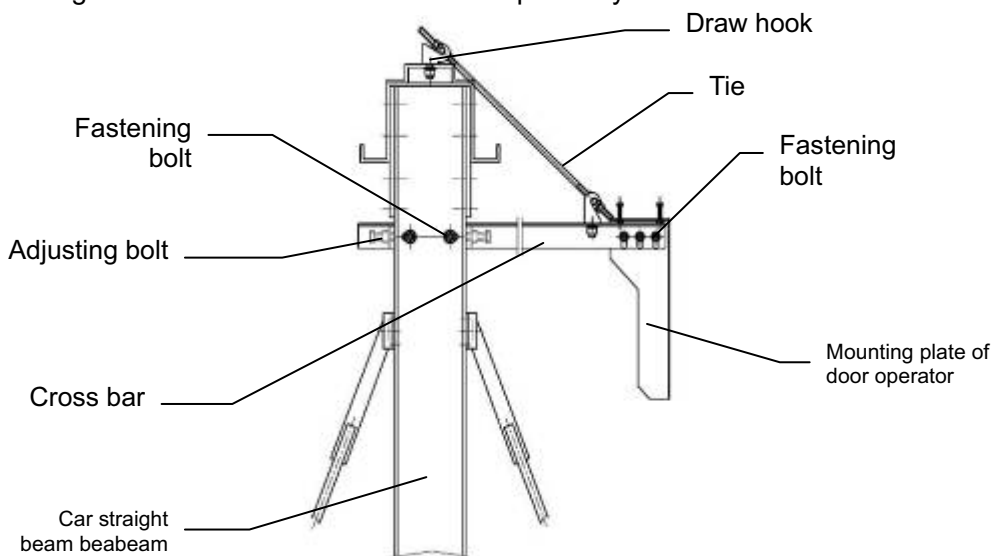


Figure 2-5 Installation of the tie and cross bar of door operator

2.2.1.3 Installation of the car roof

Fix the car roof mounting bracket of door operator on the C type slot on the car roof with fastening bolts. See Figure 2-6

Car roof mounting bracket of door operator

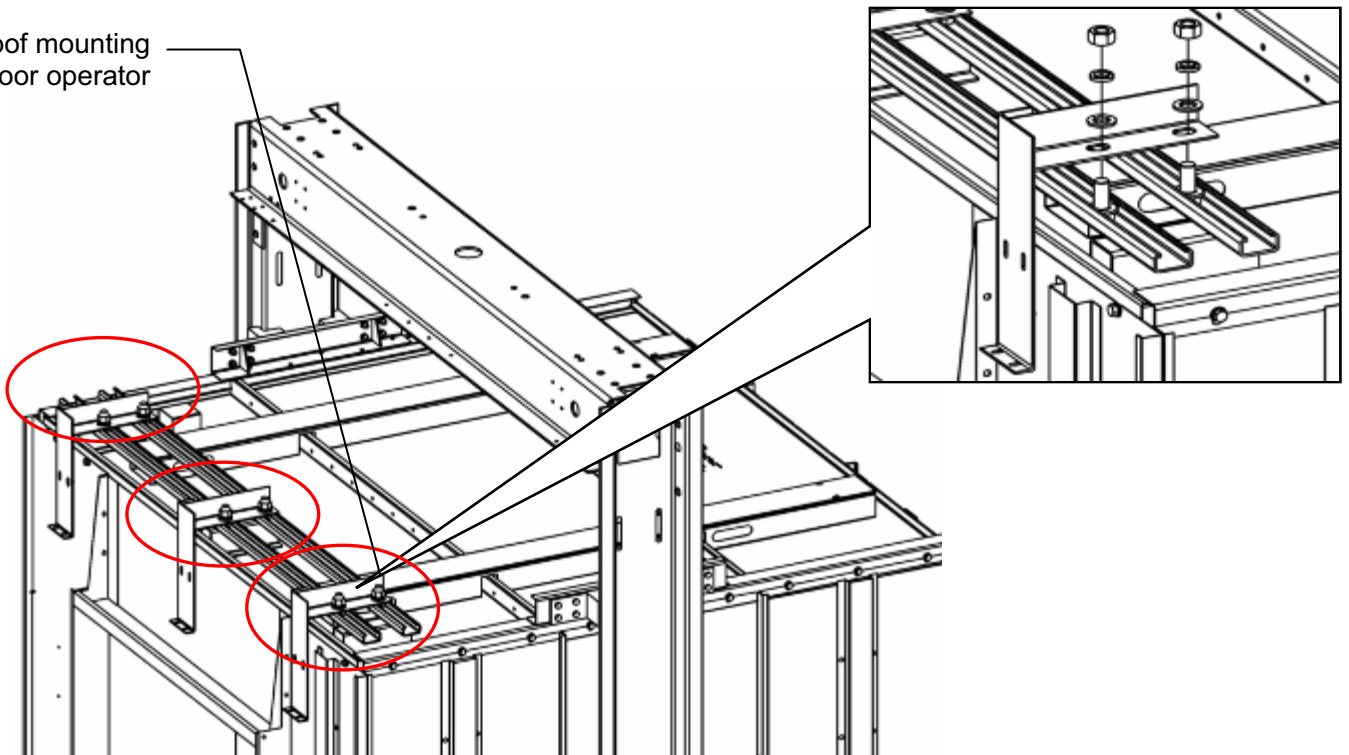


Figure 2-6 Installation of mounting bracket of door operator (installation of the car roof)
2.2.2 Installation and adjustment of Jarless – con door operator

The connecting bolts should be mounted into the mounting holes on the door head of the door operator in advance. Then connect the door operator and its mounting bracket with connecting bolts. Adjust the position of the door operator after installation. It is required that the door operator rail should be parallel to the car door sill. Also, the door operator should be kept vertical by checking with plumbline. Splines can be used to keep parallelism. The bias of parallelism and verticality should be limited to less than 1 mm. Adjust simultaneously both the door operator center and exit and entrance center to make them match; Adjust the height of the door operator to make sure it is suitable for installation of door plate. See Figure 2-7 Installation illustration of upright of door operator, Figure 2-8 Installation illustration of straight beam of door operator, and Figure 2-9 Installation illustration of car roof of door operator

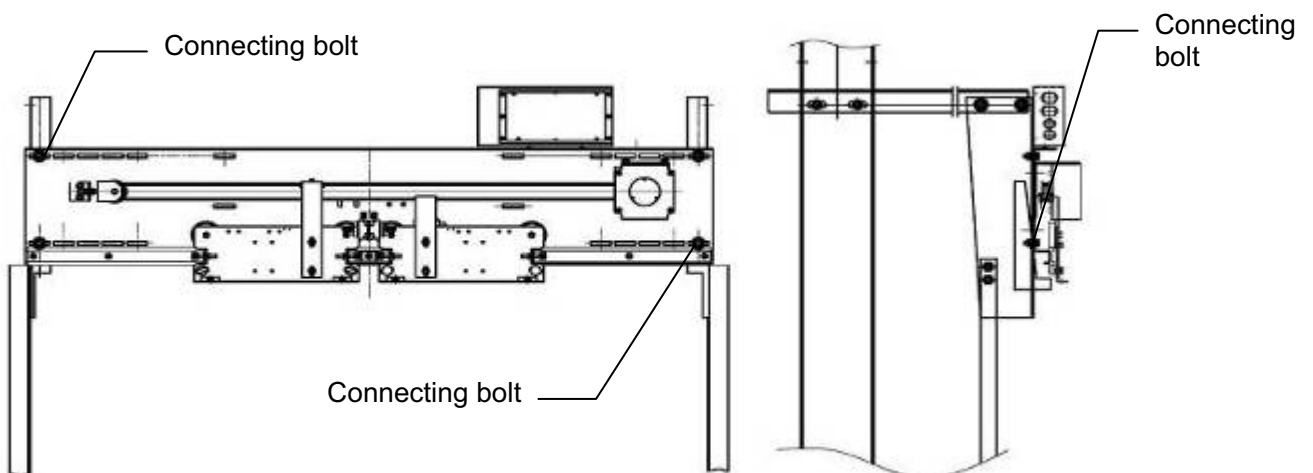


Figure 2-7 Installation illustration of upright of door operator

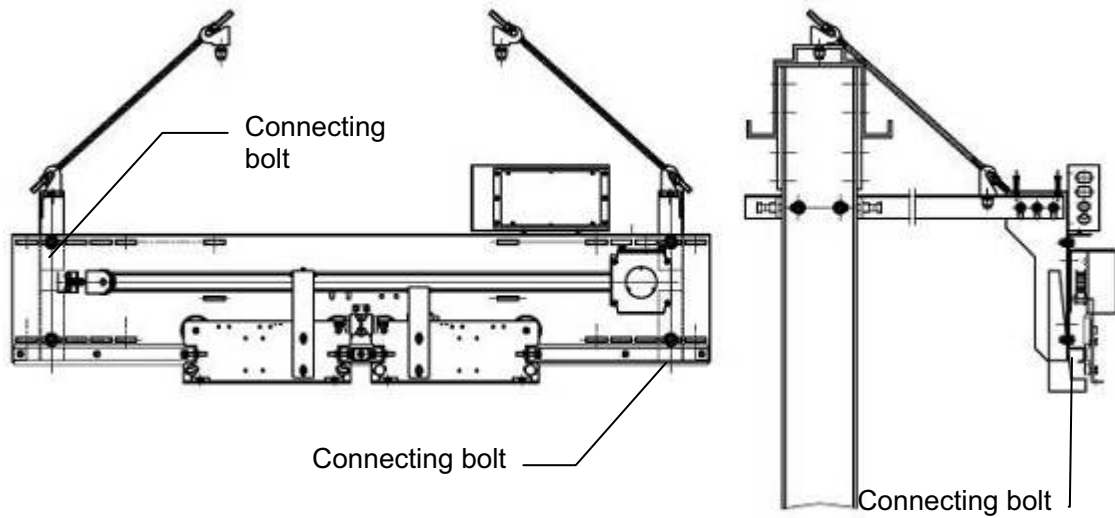


Figure 2-8 Installation illustration of straight beam of door operator

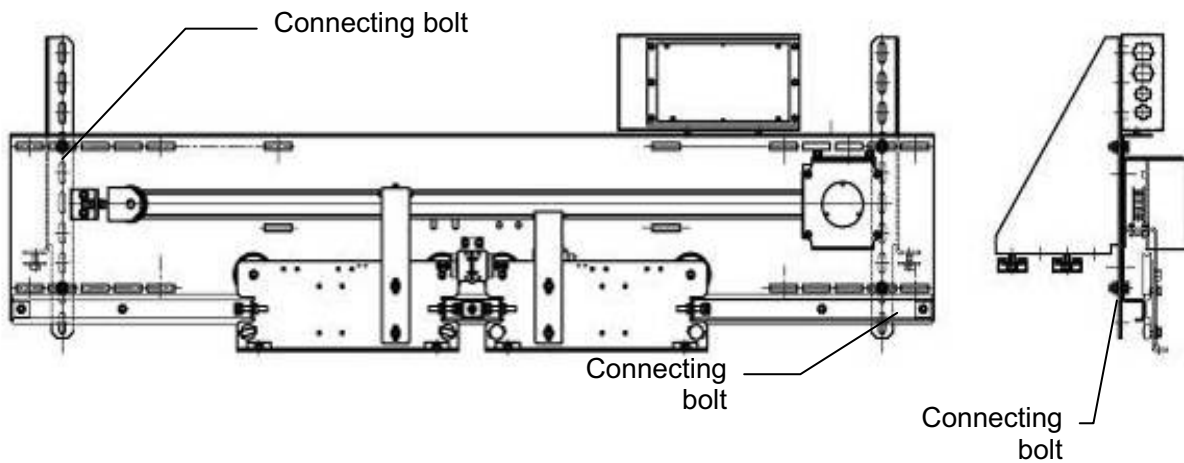


Figure 2-9 Installation illustration of car roof of door operator

2.2.3 Installation and adjustment of car door board

2.2.3.1 Installation of car door board

First mount the slide block as shown in Figure 2-10. Then adjust the clearance between the eccentric and door rail. The clearance should be limited within the range of 0.2 to 0.5 mm.

Measure it with a clearance gauge. See Figure 2-11

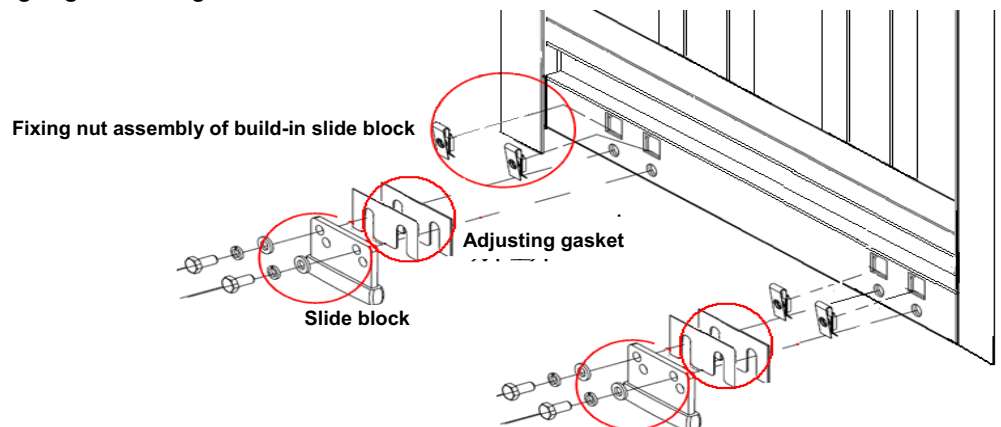


Figure 2-10 Installation of slide block of the door

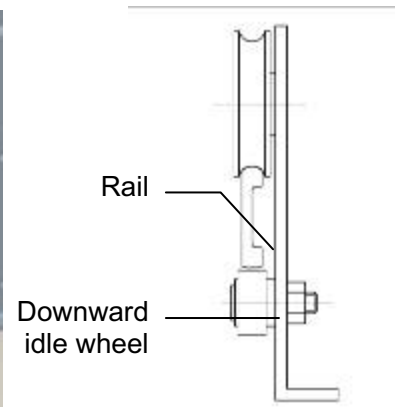
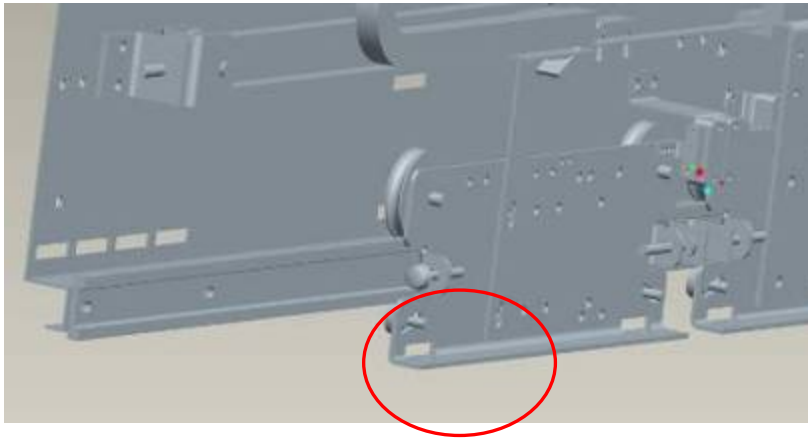


Figure 2-11 Adjustment of downward idle wheel of the hanging board

Installing the car door board

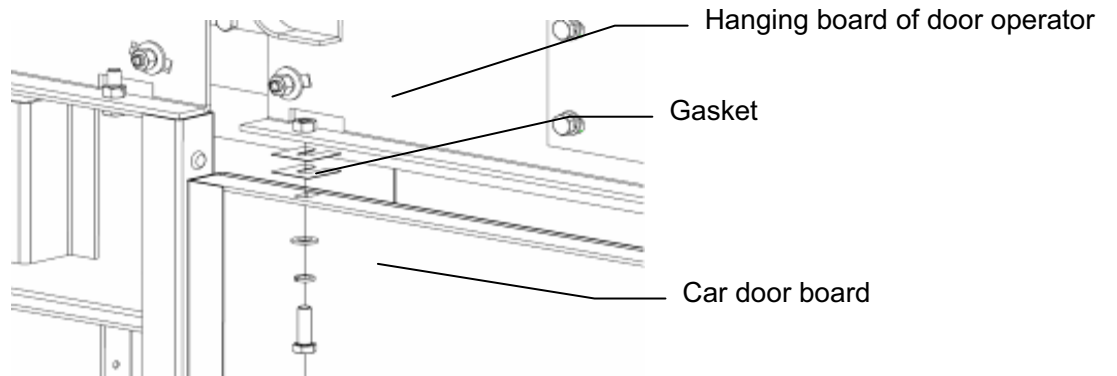


Figure 2-12 Installation of the car door board

2.2.3.2 Adjustment of the car door board

1. Check and adjust the verticality of the door board with a plumbline to limit the difference within 1 mm. See Figure 2-13

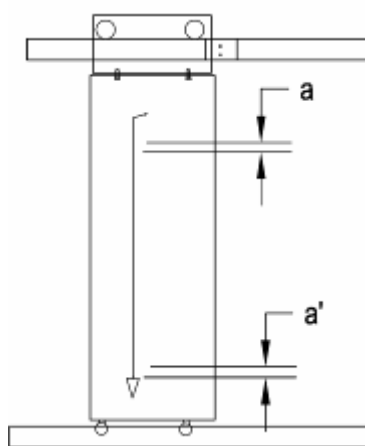


Figure 2-13 Front view of the car door configuration

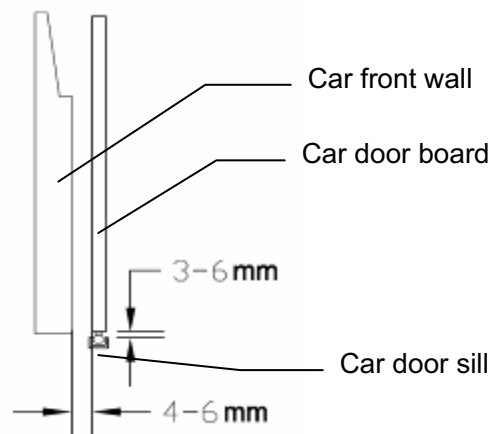


Figure 2-14 Side view of the car door configuration

2. The clearance between the car door leaf bottom and the sill surface is 3 to 6 mm, and the clearance between the car door leaf and the front wall of the car is 4 to 6 mm (the clearances of both sides differ by less than 1 mm); See Figure 2-14 side view of the car door configuration.

3. The clearance between door leafs are less than 2 mm (i.e. $a, a' \leq 2\text{mm}$). Besides, the clearances on the upper part and the lower part should be uniform (i.e. $a'-a \leq 0.5\text{mm}$). See Figure 2-15 Front view of the car door configuration

4. The lapping distance of two door leaves should be shorter than 1 mm when the center-opening door is shut. See Figure 2-16 Top view of the car door configuration

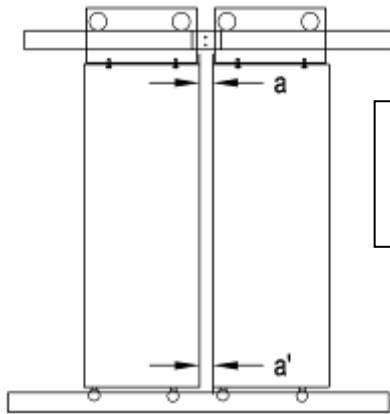


Figure 2-15 Front view of the car door configuration

$a' \leq 2\text{mm};$
 $a \leq 2\text{mm};$
 $a'-a \leq 0.5\text{mm}.$

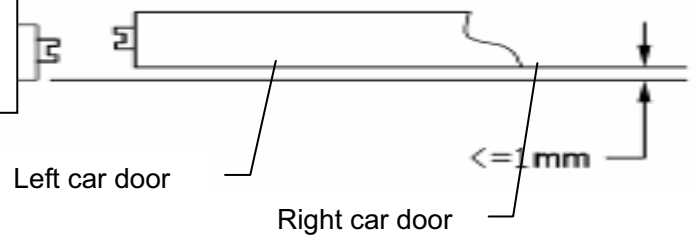


Figure 2-16 Side view of the car door configuration

5. After adjusting, fix all the bolts and push the car door to make sure that the car door can slide smoothly.

6. When the car door is opened completely, the front wall of the car should be flush with the car door.

2.2.4 Installation and adjustment of the door cutter

2.2.4.1 Installation of the swing-boom asynchronous door cutter

The swing-boom asynchronous door cutter should be mounted on the car door board (see Figure 2-17). One end of the link should be connected with the door cutter crank while the other end should be connected with the door head. In addition, the rotational part of the door cutter and the swing boom should be able to move freely.

Door head of the Door operator

Requirements for installation:

a. The clearance between the door cutter and the hall door sill is 5 to 10 mm (allowing for the clearance between the door cutter and the upper sill casing).

b. The occlusion length between the door cutter and hall door lock roller is 7 to 9 mm. In leveling position, the door lock roller is in the middle of the two blades of the door cutter so that the roller will not collide with the cutter blade while the elevator is running.

c. The verticality of door cutter is limited within 0.5 mm. The space between two blades is 70 to 72 mm when the car door is closed completely.

d. A 6 mm fixing screw should be used to fix the door cutter and the door leaf. The door cutter should not be polished.

e. The door cutter is not allowed to collide with the door lifting block, and the position of the door cutter pit and the door lifting block should be suitable.

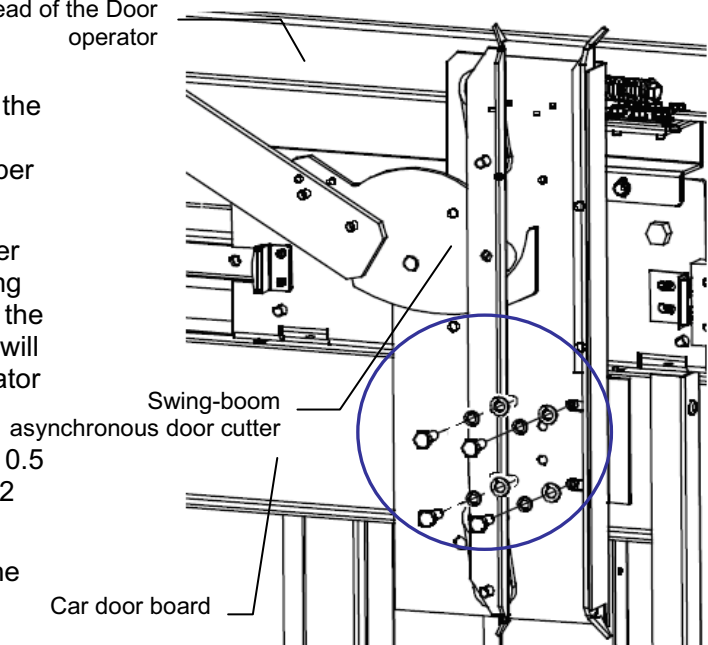


Figure 2-17 Installation of the swing-boom asynchronous door cutter

2.2.4.2 Installation of the pulling protection asynchronous door cutter

The pulling protection asynchronous door cutter is installed with fastening bolts on the hanging board of the door operator. See Figure 2-18

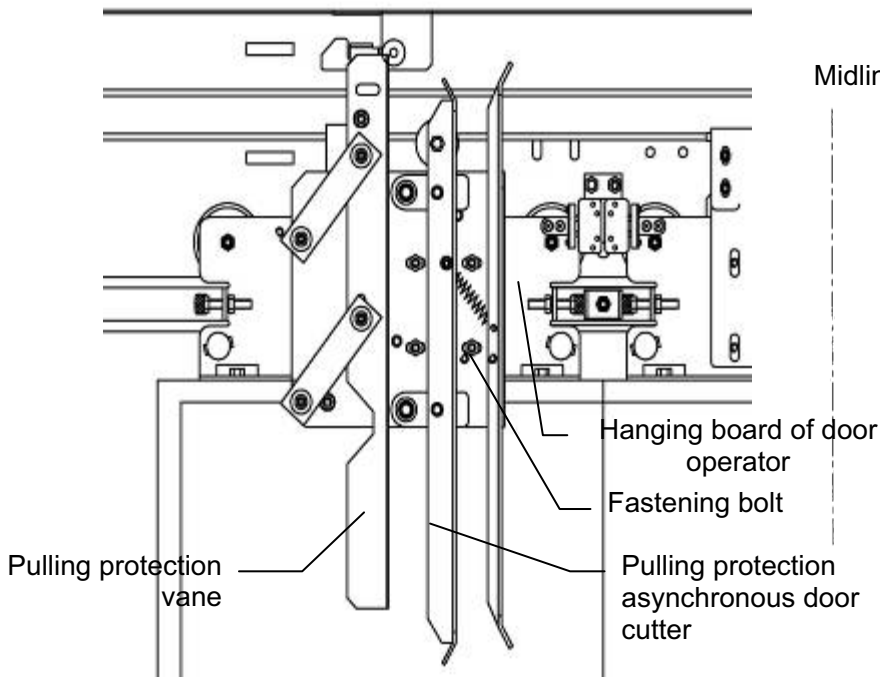


Figure 2-18 Installation of the pulling protection asynchronous door cutter

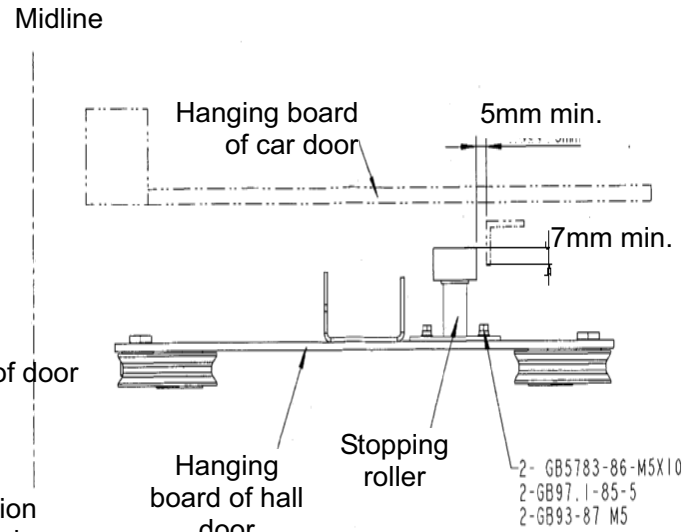


Figure 2-19 Configuration of the pulling protection vane

Requirements for installation:

1. The clearance between the door cutter and the hall door sill is 5 to 10 mm (allowing for the clearance between the door cutter and the upper sill casing).
2. The occlusion length between the door cutter and hall door lock roller is 7 to 9 mm. In leveling position, the door lock roller is in the middle of the two blades of the door cutter so that the roller will not collide with the cutter blade while the elevator is running.
3. The verticality of door cutter is limited within 0.5 mm. The space between two blades is 70 to 72 mm when the car door is closed completely.
4. The door cutter is not allowed to collide with the door lifting block, and the position of the door cutter roller and the door lifting block should be suitable.
5. When the door is closed, the relative position of the stopping roller (installed on the hall door hanging board) to the pulling protection door cutter is shown in Figure 2-19. In addition, the distance between the stopping roller and the pulling protection door cutter should be longer than 5 mm when the pulling protection door cutter is in uplift position (during the door closing process, the roller on the pulling protection door cutter will rise under the effect of the bracket of the door operator). In this case, the bracket of the vane will separate from the bracket of the door operator.
6. When the elevator is in leveling position, if the car door is pulled open with hand, the pulling protection door cutter will start to deflect downwards with the two swing links to the central position of the door and the stopping roller will start to contact with the pulling protection door cutter. At this time, though the vane is moving downwards, the brackets on the pulling protection door cutter and the door operator will separate from each other under the effect of the stopping roller.
7. When the elevator is not in leveling position, if the car door is pulled open with hands, the pulling protection door cutter will start to deflect downwards with the two swing links to the central position of the door. In this case, if the door board is kept being opened by hand, the brackets on the vane and on the door operator will clasp each other so that the door can not be opened.

2.2.4.3 Installation of the synchronous door cutter

The synchronous door cutter is installed with fastening bolts on the hanging board of the door operator. See Figure 2-20

Requirements for installation:

- The clearance between the door cutter and the hall door sill is 5 to 10 mm (allowing for the clearance between the door cutter and the upper sill casing).
- The occlusion length between the door cutter and hall door lock roller is 7 to 9 mm. In leveling position, the door lock roller is in the middle of the two blades of the door cutter so that the roller will not collide with the cutter blade while the elevator is running.
- The verticality of door cutter is limited within 0.5 mm. The space between two blades is 70 to 72 mm when the car door is closed completely.
- The door cutter is not allowed to collide with the door lifting block, and the position of the door cutter pit and the door lifting block should be suitable.

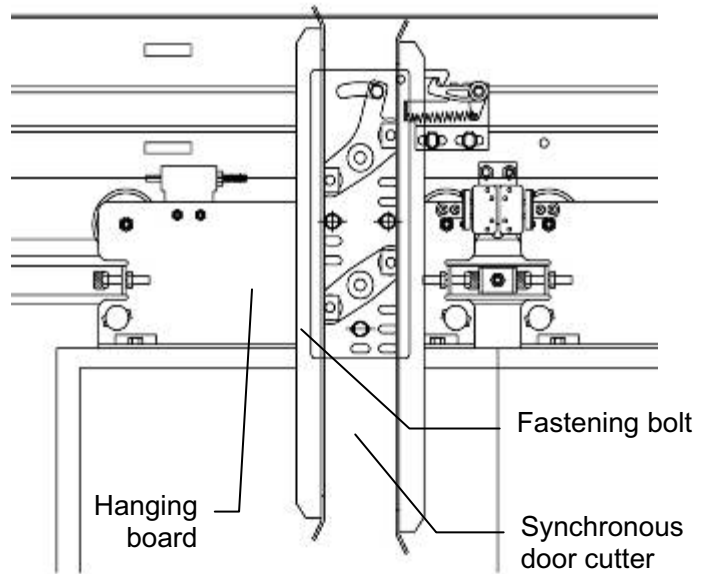


Figure 2-20 Installation of the synchronous door cutter

2.2.5 Adjustment of hanging board resistance

When there is much resistance of operation, adjust the clearance of the lower roller of the hanging board and the rail to 0.1~0.3 mm as shown in Fig. 2-6 to make the door open and close smoothly.

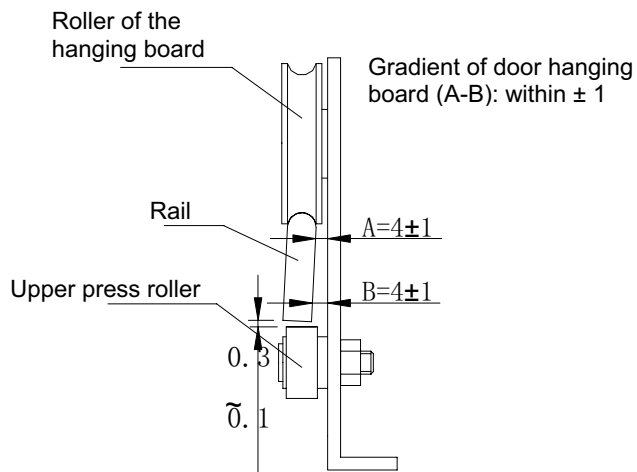


Fig. 2-21 Adjustment of door hanging board

2.2.6 Wiring of door protection

2.2.6.1 Wiring of the safety edge

When the safety edge is fitted, its wiring is in accordance with figure 2-21. The cable should be tied securely with tape in reverse pulling fashion on the car door and connected to the control circuit through the drag chain by means of the bracket of drag chain.

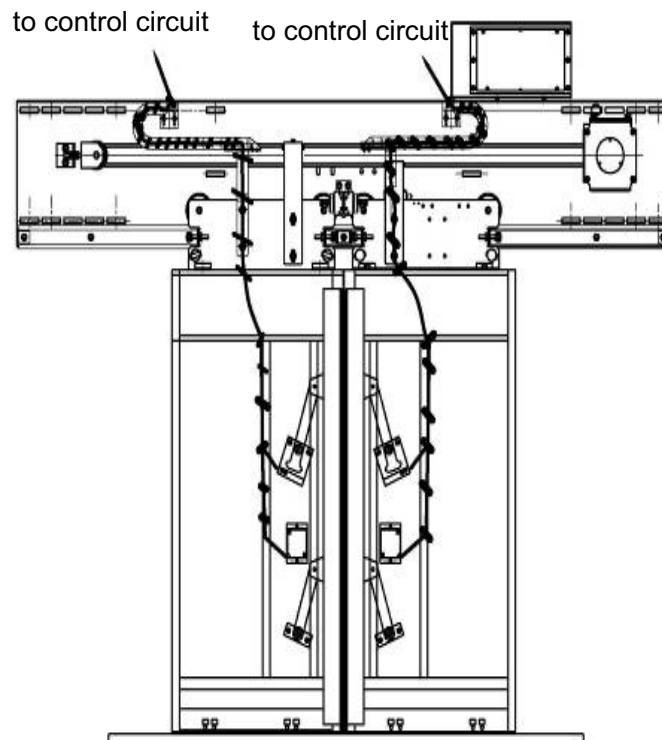


Figure 2-22 Wiring of the safety edge

2.2.6.2 Wiring of the light curtain

When fitting the light curtain, the wiring of the safety edge is in accordance with figure 2-22. The cable should be tied securely with tape in reverse pulling fashion on the car door and connected to the control circuit through the drag chain by means of the bracket of drag chain.

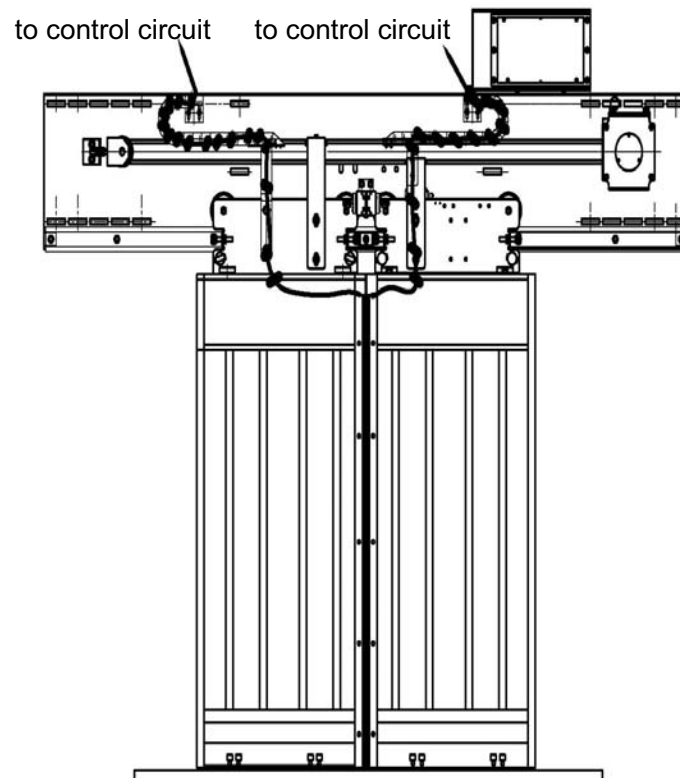


Figure 2-23 Wiring of the light curtain

Requirements for light curtain installation:

1. The surface at the bottom of the light curtain should be flush with that of the fixing bracket, and the distance between the surface at the bottom of the light curtain and the surface at the bottom of the car door board should be 10 mm at least; The two light curtains should be 10 to 20 mm apart from each other when the door is closed; All the mounting holes of the light curtain should be fixed on the door leaves.
2. The light curtain line should be fixed securely along the strengthening rib of the door board with tape in reverse pulling fashion, and then it is connected to the junction box of light-beam curtain on the car roof.
3. After the light curtain is installed, it should be grounded. The ground line is connected to the car door with bolts and is made into a loop connected with the ground line on the car roof.

3 Electrical adjustment

3.1 Wiring of transducer

3.1.1 System with DO/DC signals

The input and output ports of the transducer are shown in Fig. 3-1

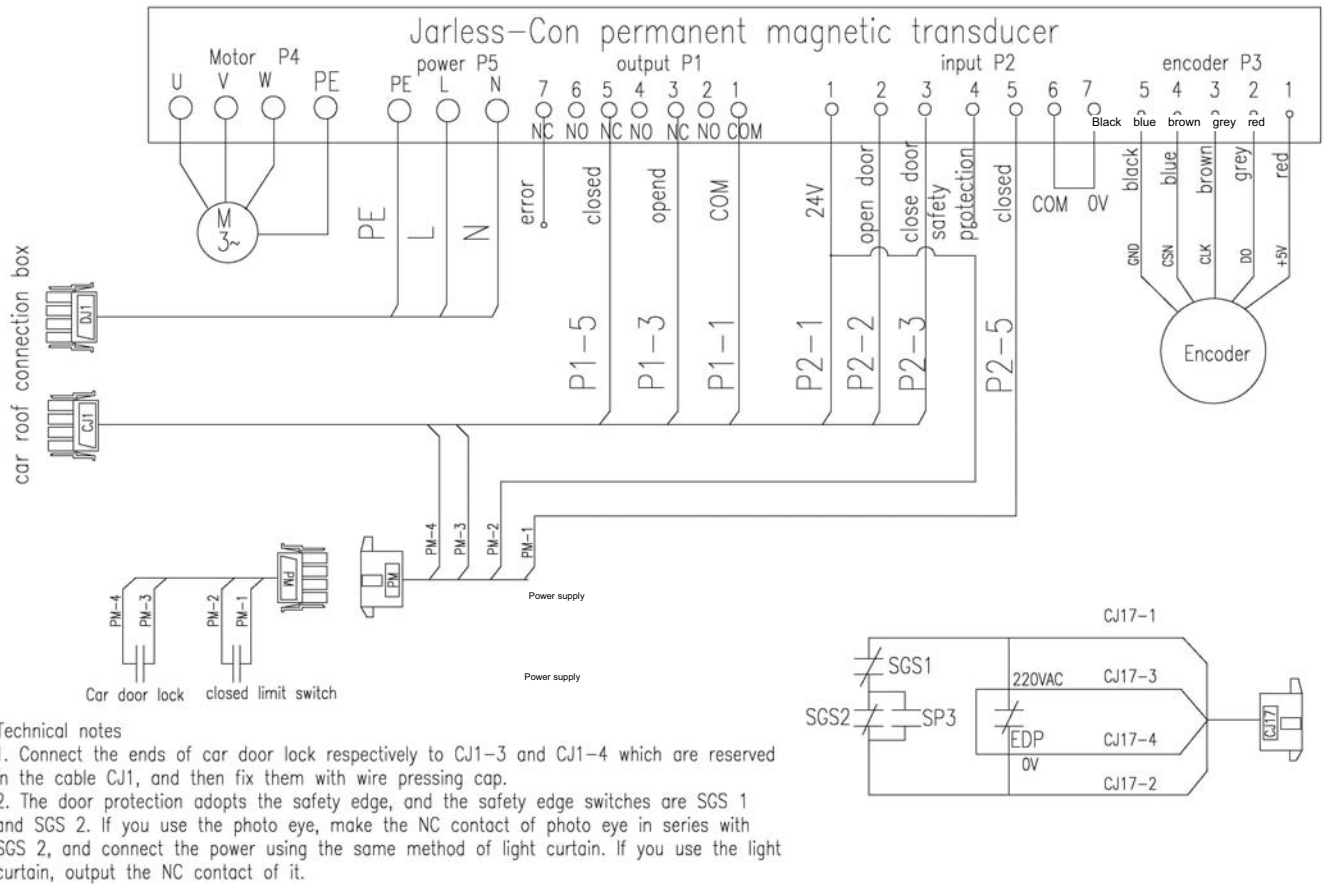


Fig. 3-1 Wiring diagram of input and output ports

3.1.2 Definition and description of input and output ports

As shown in Tab. 3-2 and Tab. 3-3

Tab.3-2 Definition of output port

Terminal No.	Description
P2-1	24V
P2-2	Signal of opening the door
P2-3	Signal of closing the door
P2-4	Safety actuated signal
P2-5	Closing door arrival magnetic switch signal
P2-6	COM
P2-7	0V

Tab. 3-3 Definition of input port

Terminal No.	Description
P1-1	Common terminal of the output relay
P1-2	NO contact output of the opened limit
P1-3	NC contact output of the opened limit
P1-4	NO contact output of the closed limit
P1-5	NC contact output of the closed limit
P1-6	NO contact output of the fault signal
P1-7	NC contact output of the fault signal

3.2 Outside view of the controller



- Note: Those solid circles in the figure represent indicators for corresponding functions
- Power: Constantly on when the power is normal
- Preparation/ fault light: Glint when it is normal, constantly on when fault occurs.
- Door closed limit input: When the door reaches closed limit, the arrival switches signal inputs, and the light is on.
- Open door input: The opening signal light is constantly on as there is opening signal
- Close door input: The closing signal light is constantly on as there is closing signal
- Door opened limit output: When the door reaches the opened limit, the light is on, and the transducer outputs the signal of reaching the opened limit.
- Door closed limit output: When the door reaches the closed limit, the light is on, and the transducer outputs the signal of reaching the closed limit.
- Fault output: As fault happens, the light is on, and the transducer outputs the fault signal.
- Protective output: The light is off when there is no motor output, and constantly on when there is motor output.

3.3 Buttons, knobs and DIP switches

3.3.1 Buttons and DIP switches



3.3.2 Knobs



If it is turned anticlockwise, the speed or torque will increase; if it is turned clockwise, the speed or torque will decrease.

3.4 Adjustment steps

Basic adjustment steps: applicable when the completed machine is produced by the factory

Senior adjustment steps: applicable after replacing the motor or the transducer

3.4.1 Basic adjustment steps

The door operator has taken the basic steps such as motor positioning, parameter selection, autotuning of door width, demonstration operation and mode modification when it's produced by the factory. The adjustment staffs make the adjustment on the construction site in accordance with the following steps:

3.4.1.1 Autotuning

Turn SW 2, SW 3 to ON, and press learn button. In this case the door will operate in the direction of closing door-door closed limit-opening door-door opened limit-closing door-door closed limit. Autotuning is completed.

3.4.1.2 Demonstration operation

Turn SW 2, SW 3 to ON, and press run button. The door will reach the closed limit first, and then press run button again to make the door repeat opening and closing.

3.4.1.3 Setting for normal mode

Turn the mode selection switch SW 2 to OFF, and the door begins to close until it reaches the closed limit. Wait for the commands of opening or closing from the control system.

3.4.2 Senior adjustment steps

When you are replacing the motor or transducer, or the door operator runs abnormally, make the adjustment in accordance with the following steps:

3.4.2.1 Parameter selection

Motor parameter selection: turn to menu F 2-0, select 43.5 W or 94.3 W as per the motor size.

Door cutter parameter selection: turn to menu F 4-18, select 0 for asynchronous door cutter, and select 1 for synchronous door cutter.

3.4.2.2 Positioning

If the door board is light, positioning with car door board is possible. But if the door board is heavy (such as glass door), it's necessary to make the positioning with no-load motor. When you are making the positioning with car door, do not put the car door on the position of opened or closed limit; otherwise the positioning may be inaccurate. The method of positioning should be as follows:

Turn SW 2 to ON, and turn SW 3 to OFF, and then press the learn button key. In this case, the motor will rotate for a certain angle. Positioning will be completed 5 seconds later.

3.4.2.3 Autotuning

Place the door in the middle, and turn SW 2, SW 3 to ON, then press learn button key. In this case, the autotuning begins, and the door will move towards the direction of closing. If the door moves towards the direction of opening, turn SW 1 to the adverse condition (i.e. if SW 1 is ON, turn it to OFF; if it's OFF, turn it to ON).

3.4.2.4 Demonstration operation

Turn SW 2, SW 3 to ON, and then press run button key. In this case, the door will move towards the direction of closing until it reaches the closed limit. Then press run button key again, the door operator will repeat the opening and closing demonstration operation.

3.4.2.5 Setting for normal mode

Set the value of F 0-2 as 3 with the operator (see the application of operator in 3.4.7). Turn SW 2 to OFF, the door operator closes the door in place and the torque is kept. In this case the adjustment is completed, and the door operator waits for the commands of opening or closing from the control system.

3.4.3 Adjustment of the open and close speed

If the open and close speed knob is turned with a thin flat screwdriver, the running speed of the door operator will change correspondently.

3.4.4 Adjustment of the close and open hold torque

If the hold torque knob is turned with a thin flat screwdriver, the hold torque of the door operator will change correspondently.

3.4.5 Reopening torque

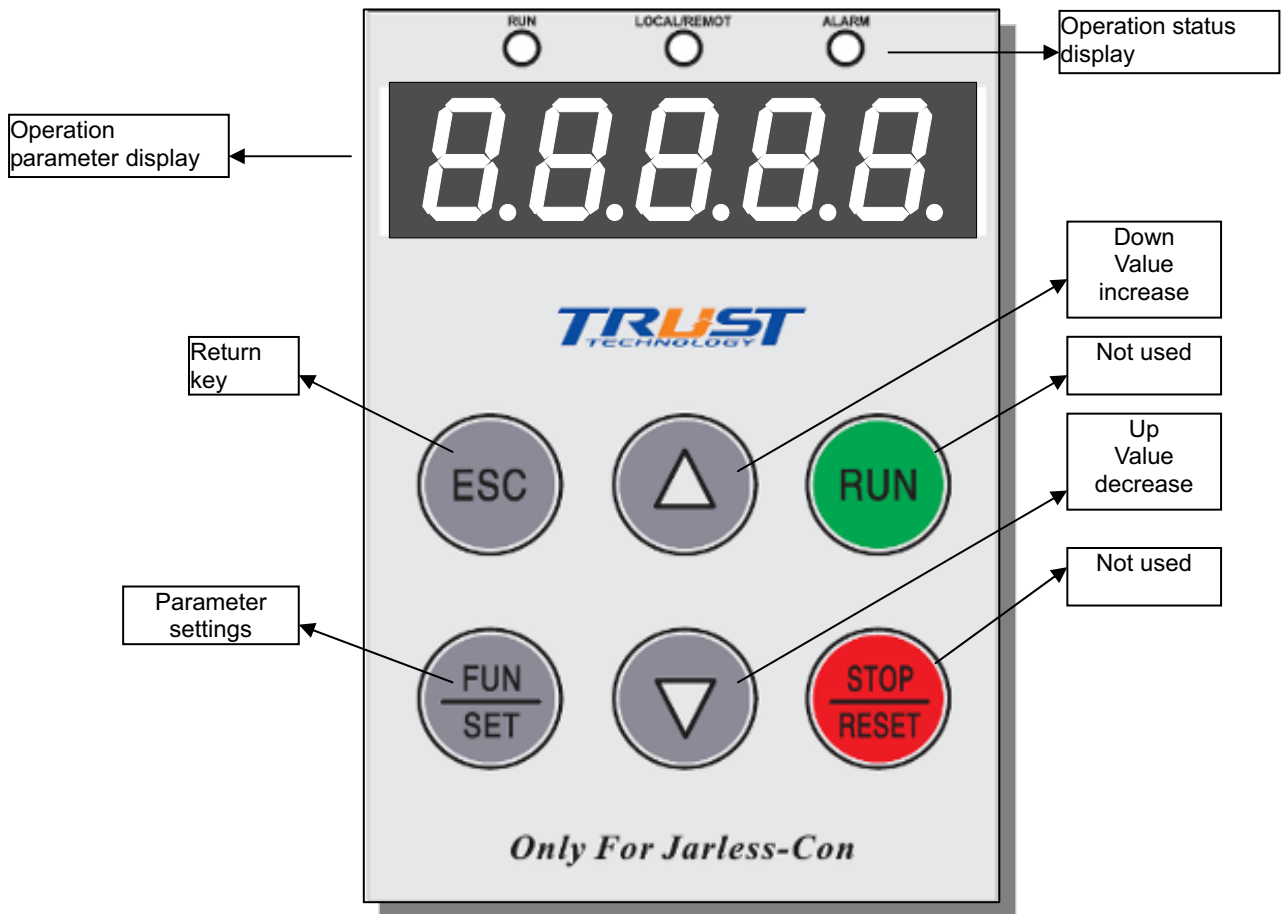
If the Reopening torque knob is turned with a thin flat screwdriver, the reopening torque of the door operator will change correspondently. (The reopening torque should be limited within 150 N).

3.4.6 Parameter initialization

If the parameter is modified by mistake during the adjustment or the door operator runs abnormally, the parameter initialization is possible. Turn SW 2 to ON and SW 3 to off , then press run button for 2 seconds. The indicator lights of opened limit and closed limit will glint for 3 times, and then the initialization is completed. Make the adjustment again following the senior adjustment steps after the initialization.

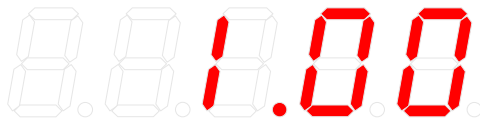
3.4.7 Application of operator


The interface of operator is shown in the figure below:




1、Checking parameters

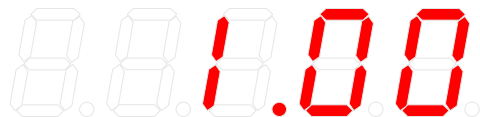
Plug the connecting line into the operator and the Jarless-con transducer and the display at this time is shown as below:



Press the DOWN key , and the operation parameters of the motor will displayed in order. These parameters are only readable and can not be changed. Refer to Tab. 3-1 for definition of these parameters.




Press the Return key , it will return to the original interface:




2、Modification of parameters




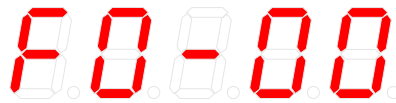
Press  again, the interface will change into:




This is the interface of the F0 parameter group. In this case, if  is pressed, the display will be:

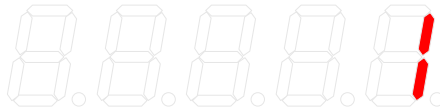


If it's necessary to modify the numbers in the F parameter group (for example modification of F0), press the function setting key , and the display will change into the following condition:




This interface means entering into the first parameter in the F0 parameter group.

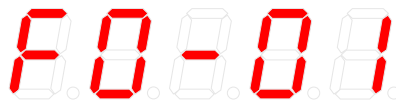
① If it's necessary to check or modify this parameter, press the function setting key  again, and the display will be




If you want to modify it to 0, press  to change the number into



Then press  to confirm. The interface will return to the second parameter of the F0 parameter group:

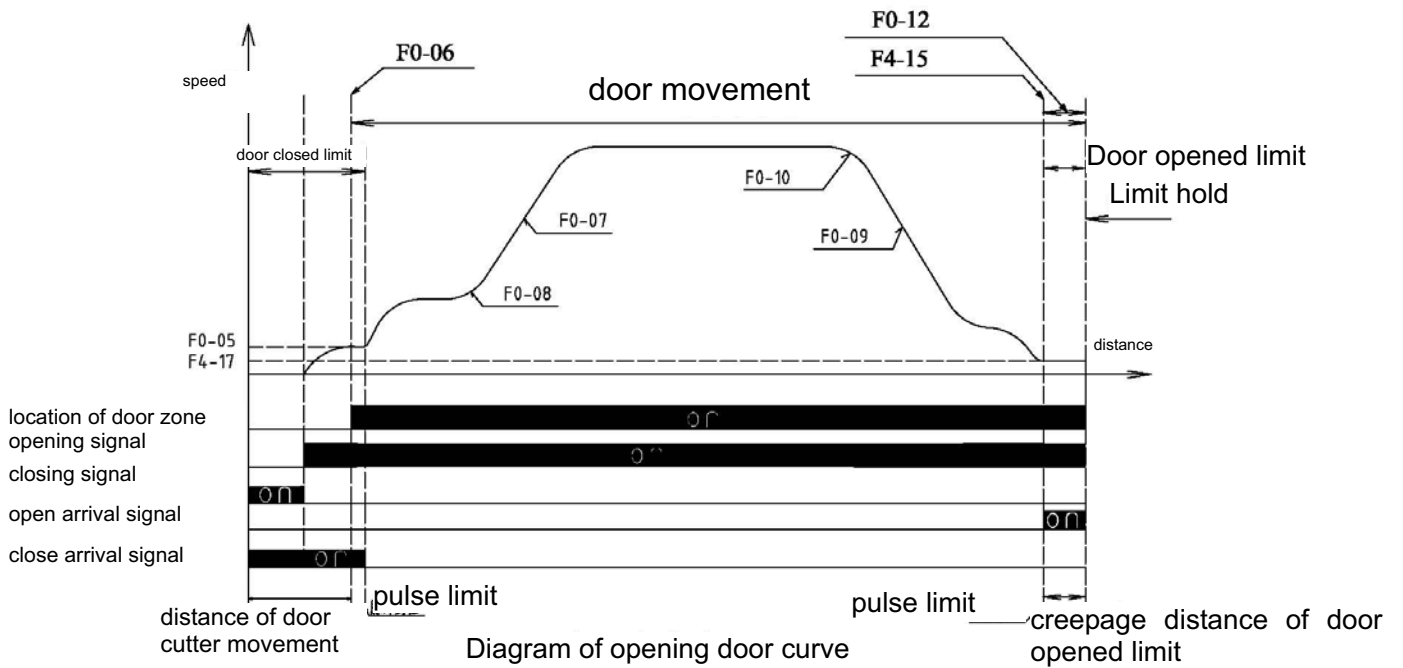


In this way the parameter is modified successfully.

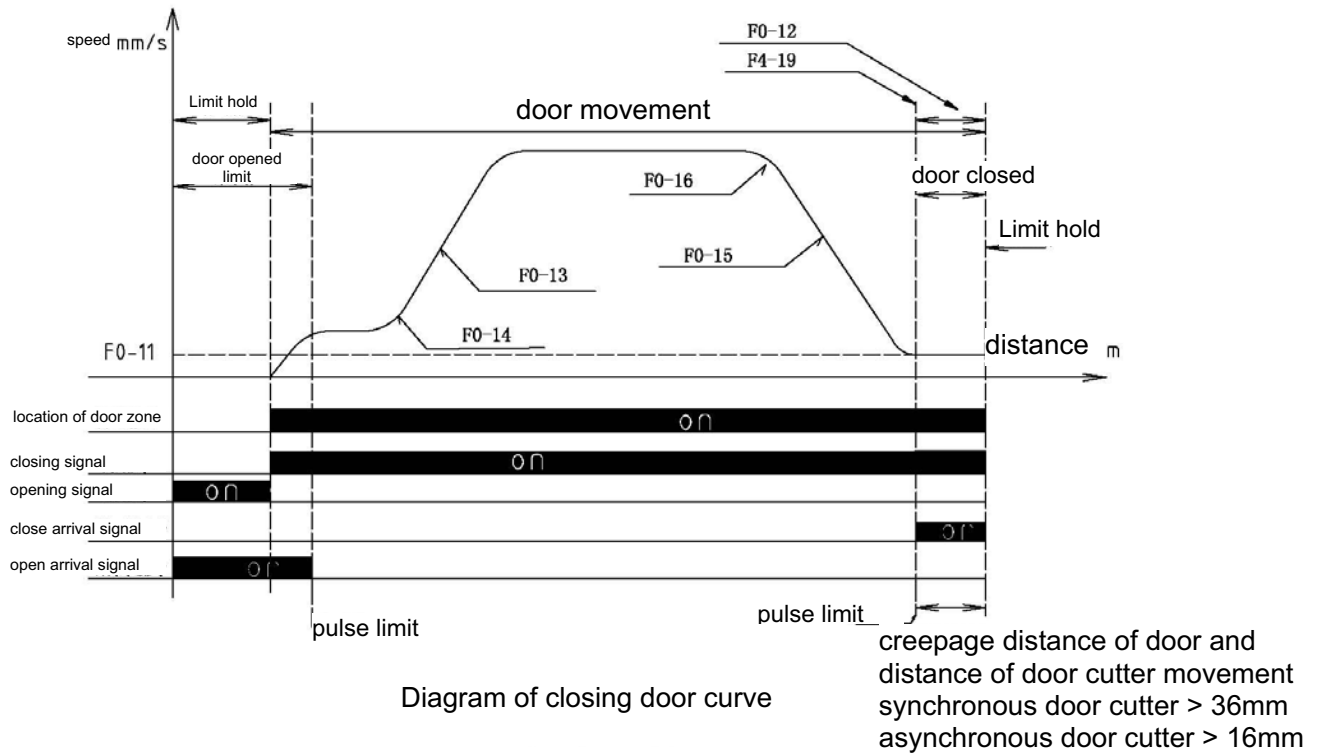
② If you don't want to check or modify this parameter, press  key to page down to parameters you want to set.

3.5 Opening and closing door curves

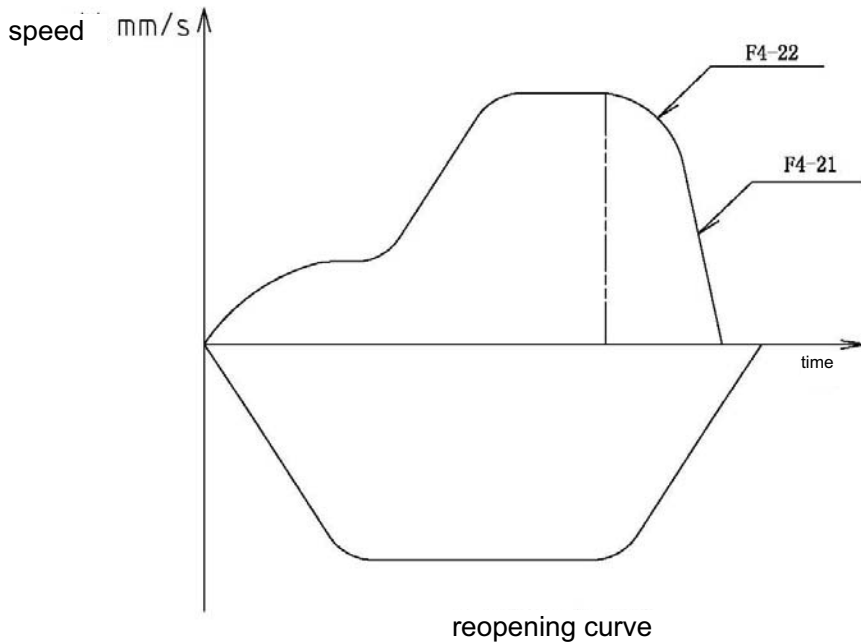
3.5.1 Opening door curve



3.5.2 Closing door curve



3.5.3 Reopening curve



3.6 Parameter list

Function No.	Name	Setting range	Default
Monitoring parameter group (server menu 311)			
0	Software version		
1	Operation frequency	0~50.00	※
2	Motor rotation speed		※
3	Rotor position	0~359.9	※
4	Given velocity		※
5	Given output voltage	0~900V	※
6	Given torque current	1.0 → rated torque	※
7	Output current	0~999.9A	※
8	Upper digits of run count		※
9	Lower digits of run count		※
10	DC busbar voltage	9999v	※
11	Encoder position	0~65536	※
12	UVW position	00	※
13	Current position	00000	※
14	INPUT 1		※
15	INPUT 2		※
16	Open door input		※
17	Close door input		※
18	Stop		※
F0 (server menu 3311) Field adjustment parameter Field Adjust) EEPROM			
F0-0	Obstruction contact memory function	0: disabled 1: enabled	无效
F0-1	Running direction reverse	0,1	0
F0-2	RUN command source	0~5	3
F0-3	Door range	0~65535	■
F0-4	Running distance at low	0~100	5

Function No.	Name	Setting range	Default
	speed of opened door arrival		
F0-5	Open Startup unlock speed	5~100mm/s	45/60
F0-6	Open Startup unlock distance	0~30.0%	3.0/5.0
F0-7	Open Acceleration speed	10~2048mm/s/s	1000
F0-8	Open Acceleration fillet	10~2048mm/s/s/s	1000
F0-9	Open Deceleration speed	10~2048mm/s/s	800
F0-10	Open Deceleration fillet	10~2048mm/s/s/s	800
F0-11	Close Arrival speed	5~100mm/s	15/30
F0-12	Running distance at low speed of closed door arrival	5~100	15/30
F0-13	Close Acceleration speed	10~2048mm/s/s	800
F0-14	Close Acceleration fillet	10~2048mm/s/s/s	800
F0-15	Close Deceleration speed	10~2048mm/s/s	600
F0-16	Close Deceleration fillet	10~2048mm/s/s/s	600
F0-17	Close Startup unlock speed	5~150mm/s	35
F0-18	Close Startup unlock distance	0 ~ 30.0% relay vibration resistance	0
F0-19	Password	0~9999	8888
F1 (server menu 3312) Regulator parameter Regulator)			
F1-0	Proportion gain 1 (high speed)	0~10000	1500/1000
F1-1	Integration gain 1 (high speed)	0~10000	800
F1-2	Proportion gain 2 (low speed)	0~10000	1500/1000
F1-3	Integration gain 2 (low speed)	0~10000	800
F1-4	PI transferring threshold value	0~100	5
F1-5	PI transferring band width	0~100	5
F1-6	Speed feedback filter	0~66 (high and low)	33
F1-7	Given proportional part filter of the torque reference	0~3	0
F1-8	Motor overspeed	1.00~2.00 1.0: Rated RPM	1.25
F1-9	Control method	0:VF 1: Asynchronous motor closed loop 2: Synchronous motor	2
F1-10	Feedback speed calculation	0: High and low levels are different 1: High speed agrees	1
F1-11	Current loop KP	0~9999	512
F1-12	Current loop KI	0~9999	150
F1-13	Electric torque limit (open door)	0.00~2.50	2.50
F1-14	Braking torque limit (open door)	0.00~2.50	2.50
F1-15	Electric torque limit (close door)	0.00~2.50	2.50
F1-16	Braking torque limit (close door)	0.00~2.50	2.50
F1-17	Motor overload protection factor	0.1~2.0	1.2
F1-18	PVT protection sensitivity factor	0~10 0: disable The larger the value is, the lower the sensitivity is.	03
F2 (server menu 3313) Motor parameter Motor Parameters)			

Function No.	Name	Setting range	Default
F2-0	Motor power	0.1~999.9 W	43.5/94.3
F2-1	Number of poles	2~100	008
F2-2	Motor rated rotation speed	1~9999	0180
F2-3	Motor rated frequency	1.00Hz~99.99Hz	12.00
F2-4	Motor rated voltage	0~999V	100/125
F2-5	Rated current	1.0~999.9	000.8/1.2
F2-6	Sheave_d	10~10000mm	00045
F2-7	gear_ratio	1.0~100.0	001.0
F2-8	Rope	1~6	1
F2-9	Magnetic pole original angle	0~65535	■
F2-10	Stator resistor	0.000~9.999 ohm	7.730/2.790
F2-11	Stator inductance	0.0~999.9mH	357.0/252.4
F2-12	Rotor resistor	0.000~9.999 ohm	5.230/1.820
F2-13	Rotor inductance	0.0~999.9mH	357.0/252.4
F2-14	Mutual inductance	0.0~999.9mH	325.0/240.6
F2-15	No-load current	0.0~999.9A	001.0/2.7
F3 (server menu 3314) Drive parameter Drive Scaling Parameters)			
F3-0	Drive No.	0~100	000
F3-1	Rated voltage	0~1000	0220
F3-2	Rated current	0.0~999.9	002.5
F3-3	Current adjusting coefficient	0.000~2.000	1.00
F3-4	Voltage adjusting coefficient	0.000~2.000	1.050
F3-5	Current limit (overcurrent)	0.0~999.9	005.0
F3-6	Busbar overvoltage point	0.00~2.00	1.4
F3-7	Busbar undervoltage point	0.00~1.00	0.60
F3-8	Input voltage coefficient	0.00~2.00	1.00
F3-9	Brake voltage	0.00~1.00 1.00:1000V	0.35
F3-10	Dead time	2~20	03
F3-11	PWM compensation	0.00~2.00	1.00
F3-12	Overshoot factor	0~100	100
F3-13	Carrier frequency	0~12 KHz	12
F3-14	Running time (hour)	0~65535 H should be saved with power down	※
F3-15	Running time (minute)	0~59 MIN should be saved with power down	※
F4 (server menu 3315) Enhanced parameter Enhanced Parameters)			
F4-0	Open/close operation hold time	0~99.9s 0: keep continuous operation Others: stop when the time is up	00.0
F4-1	Power on operation speed	10~100mm/s	0050
F4-2	Door range detection speed	10~100mm/s	0050
F4-3	Close arrival respond time	200~3000ms	1000
F4-4	Open arrival respond time	500~3000ms Hold torque after arrival	800
F4-5	Arrival signal setting	0: with open arrival and close arrival 1: without open arrival but close arrival 2: without open arrival or close arrival	1
F4-6	Open Hold torque	0~200.0%	100.0%
F4-7	Close Hold torque	0~200.0%	60.0%
F4-8	Baffle detection identification	0~999ms	200

Function No.	Name	Setting range	Default
	time	0: No function	
F4-9	Baffle torque at high speed	0~200.0% Baffle torque during acceleration	180.0%
F4-10	Close Retarding torque at constant speed	0~200.0% Retarding torque for when ACC = 0	160.0%
F4-11	Baffle torque at low speed	0~200.0% Baffle torque during deceleration	140.0%
F4-12	RY1 function selection	0: open arrival signal (switch or pulse) 1: close arrival signal (switch or pulse) 2: fault output 3: baffle detection output 4: open door output 5: close door output 6: limited open arrival signal 7: limited close arrival signal	0
F4-13	RY2 function selection		1
F4-14	RY3 function selection		2
F4-15	Open Arrival position	0~1000mm	10
F4-16	Open Speed	0~1000mm/s	0508
F4-17	Open Arrival speed	5~100mm/s	020
F4-18	Door cutter selection	0: Asynchronous door cutter 1: Synchronous door cutter	0
F4-19	Close Arrival position	0~1000mm	5
F4-20	Close Speed	0~1000mm/s	508
F4-21	Reverse open door Deceleration speed	500~9999mm/s/s	5000
F4-22	Reverse open door Deceleration fillet	500~9999mm/s/s/s	5000
F4-23	Demonstration door open hold time	0~999.9s	003.0
F4-24	Demonstration door close hold time	0~999.9s	003.0
F4-25	Manual acceleration	10~2048mm/s ²	0300
F4-26	Manual deceleration	10~2048mm/s ²	0500
F4-27	Manual speed	0~999mm/s	0050
F4-28	Master and slave status setting	0: Master status. Reopening door is possible 1: Slave status. Reopening door is impossible	0
F4-29	Empty	0	00000
F5 (server menu 3316) (VF parameter)			
F5-0	VF mode	0: Linear 1: Square	0
F5-1	Torque boost	0~50.0%	20.0%
F5-2	Automatic torque compensation limit	0~100%	000
F5-3	Baffle identification frequency ratio (at high speed)	0~100.0%	070.0
F5-4	Baffle identification frequency ratio (at low speed)	0~100.0%	050.0
F5-5	Baffle identification switch frequency	0~99.99HZ	00.50
F5-6	Baffle identification time	0~5000MS	0100

Schedule: motor configuration parameter table

Part number	Type	Color	The best value of PI	Pole	Frequent	bracket
XTA4522AAL	BM14743	Black	1500、800、1500、800	8	12	XTA4138BHX
XTA4522ABM	BM14794	Black	1500、800、1500、800	8	12	——
XTA4522ABN	PM81842	Slicery white	1000、800、1000、800	16	24	XTA4138CJT
XTA4522ABT	PMM2.3G	Slicery white	1000、800、1000、800	16	24	
XTA4522ABV	PM81855	Slicery white	1000、800、1000、800	16	24	XTA4138CYK
XTA4522ABX	PMM5.0G	Slicery white	1000、800、1000、800	16	24	

3.7 Checking fault

Check the fault code (F6) with the operator. See the following table for common fault related information (code of common fault):

Operator serial No.	Name of correspondent fault	Possible cause	Solution
1	BASE FAULT	1, Transducer has foreign objects dropping into it 2, Any two of the three phases of the motor is short circuit	1, Clear away the foreign objects 2, Check motor power line
4	PVT lost	1, Encoder circuit of transducer is abnormal 2, Connection wire of encoder is disconnected or short circuit	1, Replace transducer 2, Check encoder connecting wire
5	MOTOR OVERLOAD	1, Something suffocates the process of opening and closing door 2, Motor lacks phase during running of door operator	1, Check for foreign objects or mechanical blockage 2, Check motor power line
7	DC link OVT	1, Input voltage is too high 2, Any one of the three phases of motor is short connected to ground	1, Check input power supply voltage 2, Check motor power line
8	POWER LOST	Input power supply is low	Check the input power supply, it should be AC 220 V±20%

4 Maintenance

4.1 Periodical maintenance of the door operator

During the elevator maintenance, the door rail should be cleaned and lubricated. Also, the wear of the door hanging board should be checked. If it exceeds 1.5 mm, adjustment or replacement should be made in time.

- a) The tightness of the synchronous belt should be adjusted regularly. The requirement for the tightness is shown in Figure 4-1.

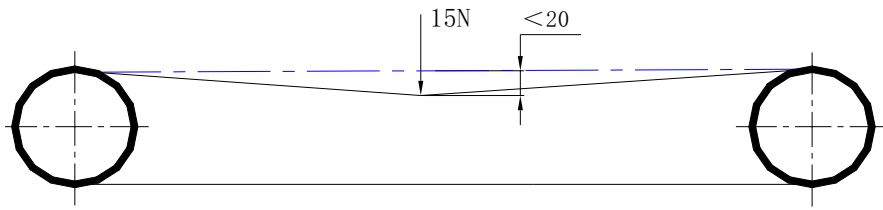


Figure 4-1 Requirement for the tightness of the synchronous belt

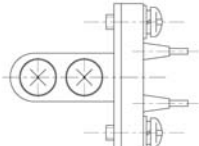
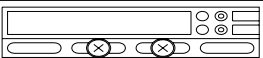
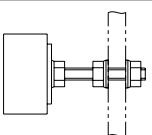
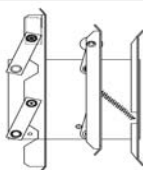
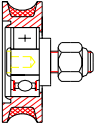
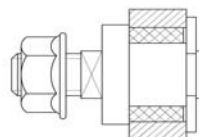
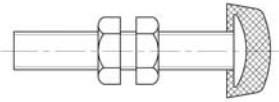
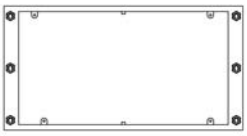
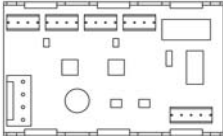
4.2 Daily maintenance of the door operator

- a) Check if the door could be opened and closed smoothly without any unusual sound.
- b) Check regularly the tightness of all the fasteners.

If any problem is found during the above mentioned checking process, measures should be taken immediately to make sure that the door operator will operate normally.

5 Main parts list

Drawing no. of parts	Name	Cutline	Spare part (number in each)	Remark
XTA4215AAL	Synchronous belt with circular arc tooth		1	Easily damaged part
XTA4284AAR	Wire guard chain		2	Easily damaged part
XTA3052AAN	Tension assembly		1	
XTA2701ACE	motor		1	
XTA4386ABA	socket		Center-opening:3 Side-opening:4 Two-panel ceter-opening:4	
XTA3386AAY	Center plug assembly		Center-opening:3 Side-opening:4 Two-panel ceter-opening:4	
XTA3386ABP	Plug assembly		1 separately on the right and left	

XTA3386AAX	Plug assembly		1	
XTA3369AAE	Magnetic switch assembly		1 (used when safety edge is equipped)	常开
XTA3370AAA	Magnet assembly		1 (used when safety edge is equipped)	
XTA2703AAE	Pulling protection asynchronous door cutter		1	
XTA3035ADR	Hanging board wheel		4	Easily damaged part
XTB3117ABE	Hanging board adjusting roller		4	Easily damaged part
XTA3189AAG	Stopping part		4	
XTA3446AAK	transducer		1	
XTA4351ABJ	R 14 board		1	

Note: 1. if the customer needs the spare part of the door operator, please mark on the contract and provide relative list of spare part.(It's necessary to purchase the spare part separately)

2. The information in this document is subject to change without notice.